Morse Code

CONTROL FREAK™
Powered by Crumble

Aims
- Through this activity students will learn to use sparkles. They should be able to make them flash in 'dashes' and 'dot' sequences to make letters and words. They can advance to incorporating switches and light sensors (see bottom of sheet).

Basic Code
To make a letter. The example here is the letter 'A' to show both a dash and a dot.

```
program start
do forever
  set sparkle 0 to ■
  wait 200 milliseconds
  turn sparkle 0 off
  wait 200 milliseconds
  set sparkle 0 to ■
  wait 500 milliseconds
  turn sparkle 0 off
  wait 1 seconds
loop
```

Resources
- Crumble board
- Sparkle x 1
- Battery pack
- Wires x 5
- USB cable
- Paper/card
- Marble

Construction Tips
Use a clear marble over a sparkle to create a concentrated beam. Make a box to build your own SOS torch!

Suggested Uses
- Explore emergency communication and the solutions to being in trouble 'off the grid'. Students create their own messages and have to work out each others' code.

Challenge Questions
- Can the code randomly pick a letter and spell it in Morse code?
- Can you make the message stop and start playing when light goes above and below a certain level?
- The Morse code dash/dot ratio is 3:1. Can you feature this in your code?

Basic Code
To make a word, each letter a different colour. The word here is 'me'

```
program start
do forever
  do 2 times
    set sparkle 0 to ■
    wait 500 milliseconds
    turn sparkle 0 off
    wait 200 milliseconds
  loop
  set sparkle 0 to ▨
  wait 200 milliseconds
  turn sparkle 0 off
  wait 1 seconds
loop
```

Intermediate Code
To make the term 'SOS' play when a switch is pressed

```
program start
do forever
  wait until A is HI
  do 3 times
    set sparkle 0 to ■
    wait 200 milliseconds
    turn sparkle 0 off
    wait 200 milliseconds
  loop
  wait 1 seconds
  do 3 times
    set sparkle 0 to ■
    wait 500 milliseconds
    turn sparkle 0 off
    wait 200 milliseconds
  loop
  wait 1 seconds
  do 3 times
    set sparkle 0 to ■
    wait 200 milliseconds
    turn sparkle 0 off
    wait 200 milliseconds
  loop
loop
```

Advanced Code
To make a message play out when a light sensor goes below a certain level. The letter here is 'A'

```
program start
do forever
  let t = analogue A
  if t < 160 then
    set sparkle 0 to ■
    wait 200 milliseconds
    turn sparkle 0 off
    wait 200 milliseconds
    set sparkle 0 to ■
    wait 500 milliseconds
    turn sparkle 0 off
    wait 1 seconds
  else
    turn sparkle 0 off
  end if
loop
```